

Strategic Use of patents

An overview

Pénin Julien

BETA – Université de Strasbourg

penin@unistra.fr

July, 2010



**Bureau
d'économie
théorique
et appliquée
(BETA)**
UMR 7522



How to valorise a patent (once you get one)?

- 1) Offensive strategy: to protect a monopoly (exclusion)
- 2) Market strategy: to trade technologies
- 3) Defensive strategy: cross-licensing
- 4) Reputation strategy: to certify and signal competences
- 5) Partnership strategy: to collaborate
- 6) Open strategy: to diffuse or free technologies

Others: Blocking strategy, internal strategy (patent to manage employees), etc.

A wide spectrum of use

**Enable
appropriation**

**Prevent
appropriation**

Strict appropriation
Ex: pharmaceuticals

Bargaining chips
Ex: electronics

Control the diffusion
of the innovation
Ex: network industries



Grant licences more or
less exclusive
Ex: chemicals

Reputation,
image, signalling

Free
technologies
Ex: biotech RT

Many different possible role for a patent

Sectoral specificities

Pénin Julien - Strategic use of
patents

Patents: practical details (1)

- ❑ A patent provides a monopoly over a technical invention on a given territory and for a maximum of 20 years (after the first application) (TRIPs agreement)
- ❑ A patent is a right to exclude (not to use)
 - ❑ Prevent others from producing, selling and using the invention
- ❑ To be patentable, an invention must be new, non-obvious and must have an industrial application
- ❑ Application must be addressed to patent offices (EPO, USPTO, OMPI), which examine them.
- ❑ No European or world patent (only centralized procedures, PCT)
 - ❑ Priority rule
- ❑ 18 months after the application, a description of the invention is disclosed (secrecy is broken)

Patents: practical details (2)

Two main patent systems: USA / rest of the world

USA

- First to invent
- 1 year grace period
- Usefulness criteria
- Moral obligation to patent
- No publication obligation
- Disclose the « Best way »
- Reexamination
- No first user right
- Geographic homogeneity

Europe (ROW)

- First to file
- Invention must be new
- Industrial application
- Automatic disclosure after 18 months
- Disclose one way to use the invention
- Opposition
- First user right
- No geographic homogeneity

1) *Offensive strategy to protect a monopoly (1)*

- ❑ Traditional « Arrowian » view: The **incentives-diffusion dilemma**

To sum up, we expect a free enterprise economy to under invest in invention and research (as compared with an ideal) because it is risky, because the product can be appropriated only to a limited extent and because of increasing returns in use... Further, to the extent that a firm succeeds in engrossing the economic value of its inventive activity, there will be an under utilization of that information as compared with an ideal allocation.

Arrow (1962)

- ❑ Patent as a **second best** solution to this dilemma
 - ❑ Enable appropriation and increase incentives (grants a monopoly)
 - ❑ Favor diffusion of the underlying knowledge
 - ❑ Monopoly deadweight loss
 - ❑ The case of pharmaceuticals
- Patent is a strategic use of patents

1) Offensive strategy *to protect a monopoly (2)*

- ❑ Real world is much more complex
- ❑ Protection is not automatic
 - ❑ A patent is a negative right (« **a license to sue** », Silberston, 1973)
 - ❑ To make protection effective is long, costly and uncertain (Lerner and Tirole, 2004)
 - Identify and deter infringers
- ❑ « The market does not like monopolies »
 - ❑ Ex: IBM and Intel (second sourcing)
 - ❑ Myriad Genetics
- ❑ The only exception: Pharmaceuticals

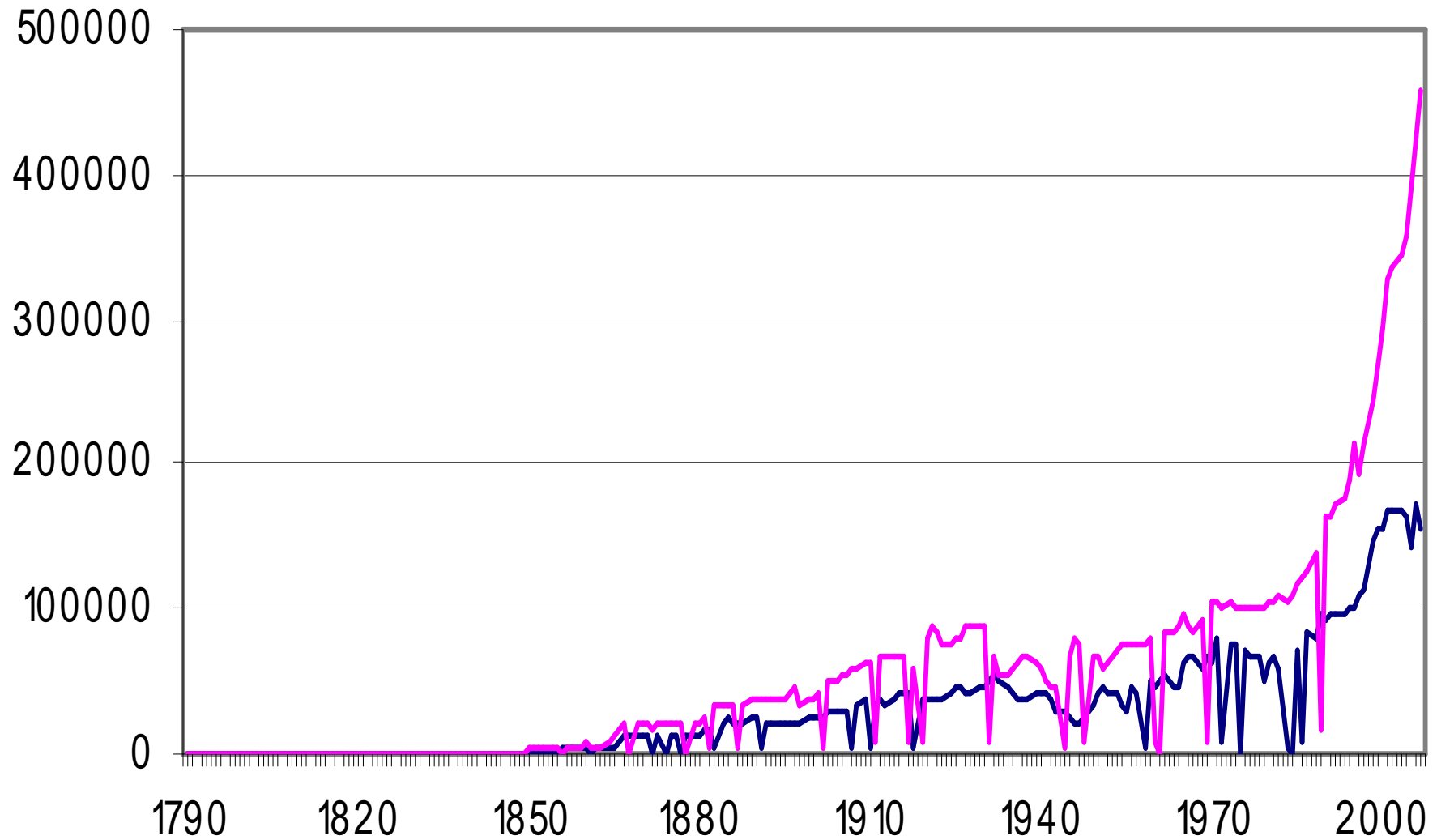
Patent paradox (Kortum and Lerner, 1999)

« Empirical studies unanimously show that firms do not consider patent as efficient to exclude infringers and to protect innovation... Yet, more and more patents are issued each years »

(Levin et al., 1987; Cohen et al., 1994)

❑ The only way to escape this paradox is to ***reconsider the way firms use the patent system***

Utility Patent Application and grant USPTO 1790-2007



Pénin Julien - Strategic use of
patents

Explanation of the paradox: beyond exclusion strategies

- ❑ A patent is not only a tool to exclude infringers and to provide monopoly power
- ❑ It is much more than that:

- ❑ Signal and certify competences
- ❑ Bargaining chips
- ❑ Trade technologies
- ❑ Manage knowledge
- ❑ To free technologies and to control diffusion

2) *Market strategy*

Patents to sell technologies

- ☐ Inventions are not all intended to be used by the inventor
 - ☐ Independent inventors
 - ☐ Non key sectors
 - ☐ Invention from the academia
 - ☐ New market for the inventor (new country)
- ☐ A patent enables inventors to sell their inventions and therefore to directly make profits from it.
 - ☐ Second reason: To force the collaboration of rivals
- ☐ Some firms make most of their turnover through licensing (Thomson, TI, Air liquide, etc.)
- ☐ « Rembrandts in the Attic », Rivette and Kline (2000)
- ☐ Chemical industry (licensing > R&D investments)
- ☐ Patents and market for technologies

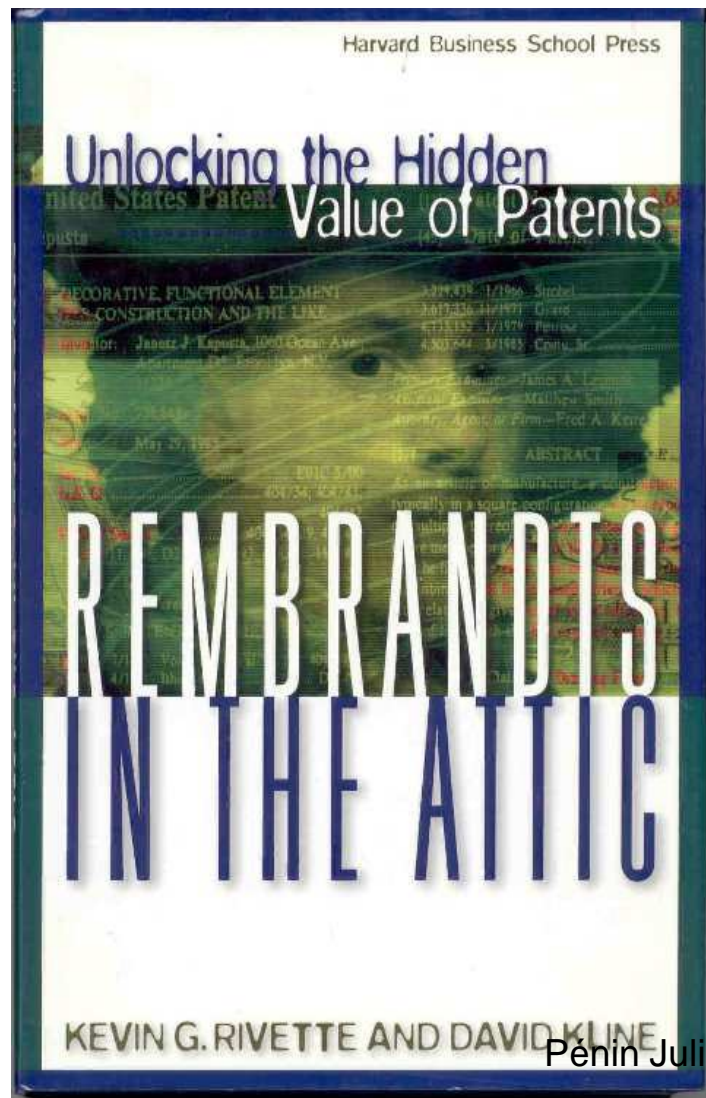
Patent: creation of a market for technologies

- ❑ The patent system eases the implementation of a market for technologies
- ❑ It enables to solve the **Arrow paradox** (1962)
 - ❑ Ex: Kearns and the windshield wiper (Tirole, 2003)

A patent has two properties: disclosure and exclusion

- ❑ Signal increases the visibility
 - ❑ Protection sustains the signal
-
- ❑ Without patents it would therefore be very difficult to trade technologies
 - ❑ The case of tacit knowledge (sticky vs. leaky)
 - ❑ Patents and inter-firms collaboration

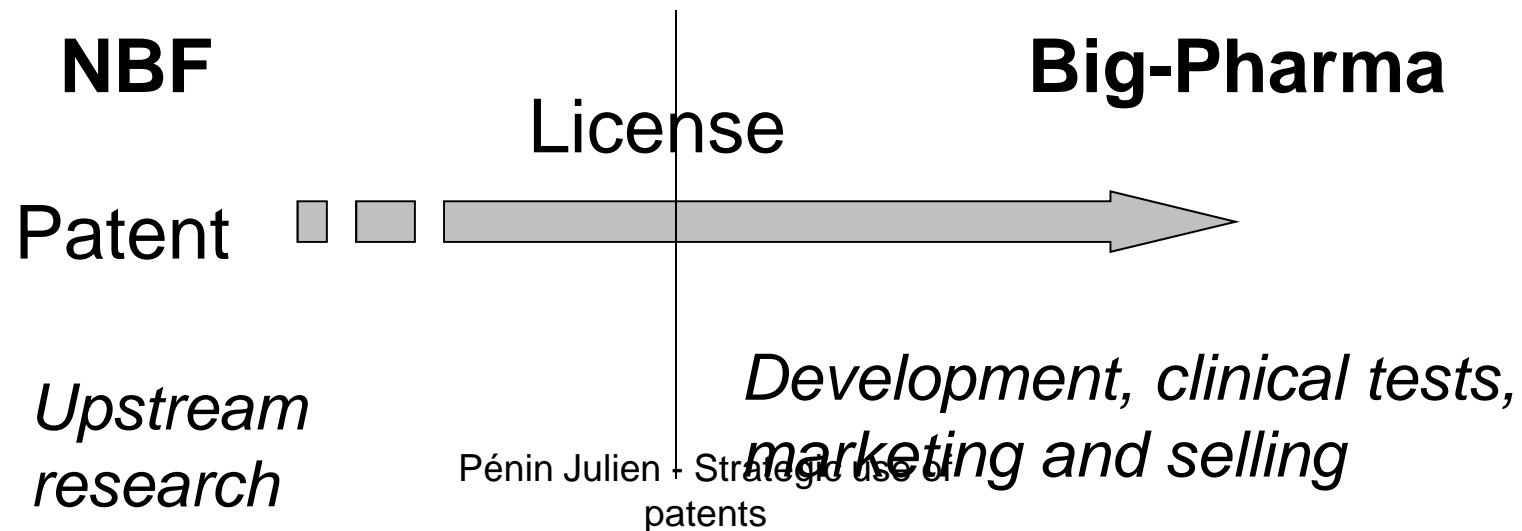
Patents, market for technologies and specialization



Pénin Julien - Strategic use of patents

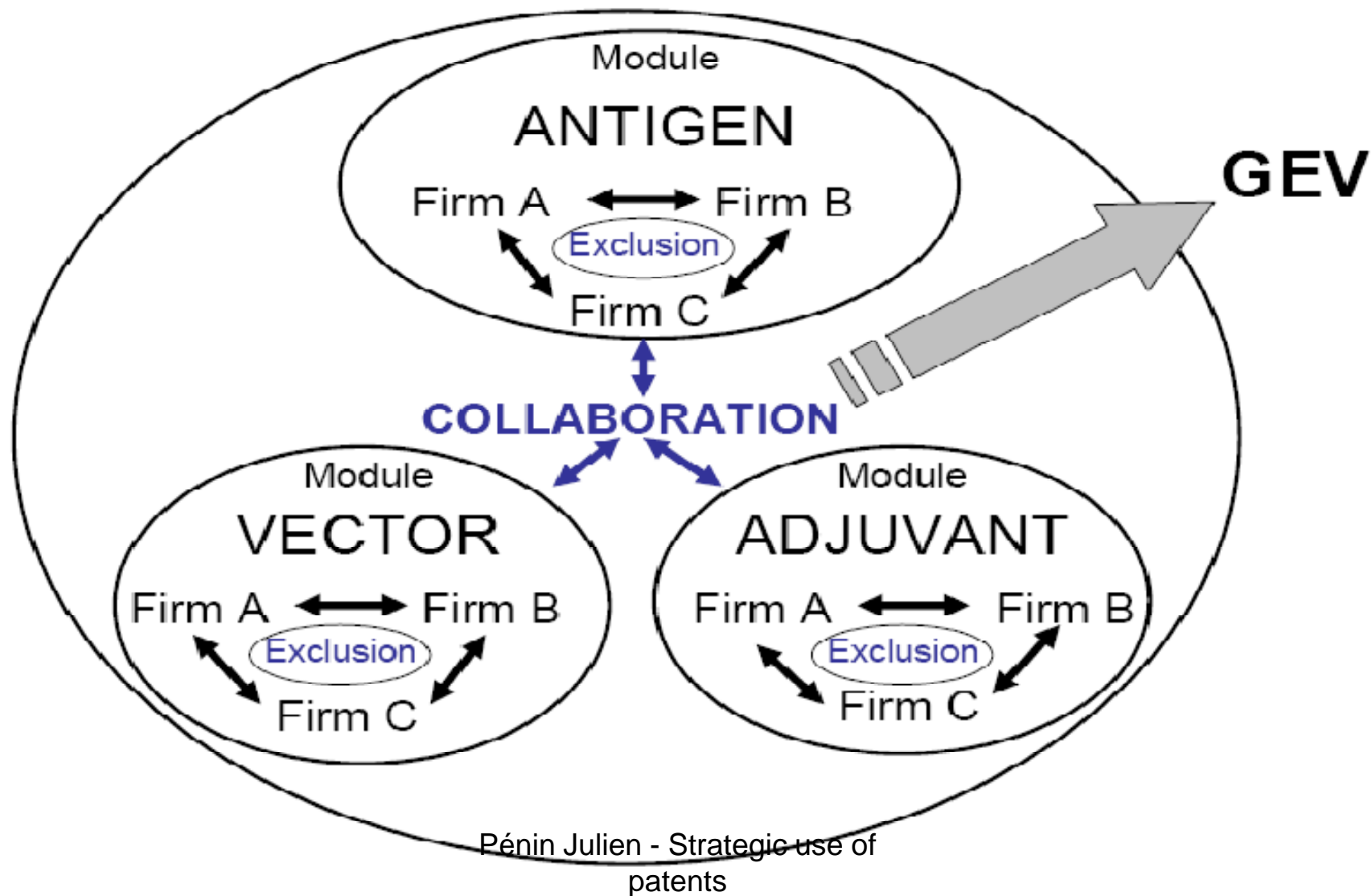
Patents, market for technologies and specialization

- ❑ Patents enables **labour division** and **specialization**
 - ❑ Specialization on core competences
- ❑ New industrial organization: emergence of **fabless** actors
- ❑ Example: Pharmaceuticals and the biotech paradigm
 - ❑ In 2003, 40% of new market molecules were coming from biotech firms
 - ❑ Random vs. rational drug screening



Co-opetition in the development of GEV

Bureth & Pénin (EJESS, 2007)



3) ***Defensive strategy*** **cross-licensing**

- ☐ Patent as « bargaining chips »
- ☐ Allows firms to keep some technological field open
 - ☐ Firms build huge patent portfolio in order to be able to barter patents, to cross-license patents when accused of infringement by other firms
 - ☐ Traditional defense when accused of infringement: (i) There is no infringement, (ii) You're patent is not valid and (iii) You are infringing one of my patent
- ☐ ***Defensive use of patents***
 - ☐ Firms use their patents to protect themselves against potential accusation of infringement
- ☐ ***Offensive use of patents***
 - ☐ Firms use their patents to sue infringers.

“Firm A's corporate patent department will wait to be notified by attorneys from firm B that it is suspected that A's activities are infringing B's patents. Because possibly germane patents and their associated claims are so numerous, it is in practice usually impossible for firm A – or firm B – to evaluate firm B's claims on their merits. **Firm A therefore responds - and this is the true defensive value of patents** in industry – by sending B copies of « a pound or two » of its possible germane patents with the suggestion that, although it is quite sure it is not infringing B, its examination shows that B is in fact probably infringing A. **The usual result is cross licensing**, with a modest fee possibly being paid by one side or the other. Who pays, it is important to note, is determined at least as much by the contenders' relative willingness to pay to avoid the expense and bother of a court fight as it is by the merits of the particular case.”

Von Hippel (1988, p. 53).

Simple vs. Complex technologies

(Kingston, 2001)

- ❑ **Simple technology (discrete)**: « A simple product or process is one that can be understood or communicated by one individual » (Roycroft and Kash, 1999, p. 262).
 - ❑ Ex: Chemicals, molecules
- ❑ **Complex technology**: « A process or product that cannot be understood in full detail by an individual expert sufficiently to communicate all details of the process or product across time and distance to other experts » (Roycroft and Kash, 1999, p. 262).
- ❑ Complex technologies are usually *multi-components*
 - ❑ Ex: electronics (Grindley et Teece, 1997)
 - ❑ Cross-licensing and patent pools
 - ❑ Historical tradition (1919 and the foundation of the RCA)
 - ❑ Exchange of « anonymous patents »

« [in complex technologies] The motivation for their extensive use of patents is therefore quite different from that of firms in simple technologies. In the latter, the emphasis may be said to be primarily offensive (to prevent others from *using* the invention); in complex technologies it is primarily defensive (to avoid being *denied* the use of an invention). »

Kingston, 2001, p. 408

Patenting in complex technologies: key issues

- ❑ « Tragedy of the anticommons » (Heller and Eisenberg, 1998)
 - ❑ « Patent ticket » (Shapiro, 2000)
 - ❑ Overall the multiplication of patent on upstream invention (basic knowledge) may slow-down the innovation process (Nelson, 2004)
 - ❑ Regulation needed
 - ❑ Compulsory licensing
 - ❑ Patent pools (a unique contact)
 - ❑ Pro or anti competitive? (Lerner & Tirole, *AER*, 2004)
 - ❑ Complementary vs. substitute patents
 - ❑ Entry barriers
- Pénin Julien - Strategic use of patents

« Tragedy of the anticommons » (1)

*Common goods and resources, if not protected by well defined property rights, are available for free to everyone, and will therefore be **over utilized**, and may even sometimes disappear because used beyond their regeneration capacities*

« Tragedy of the commons », G. Hardin (1968)

❑ This justifies either a form of public control (State) to control the access of the resource or by a privatisation of the resource

❑ By opposition: « Tragedy of the anticommons »

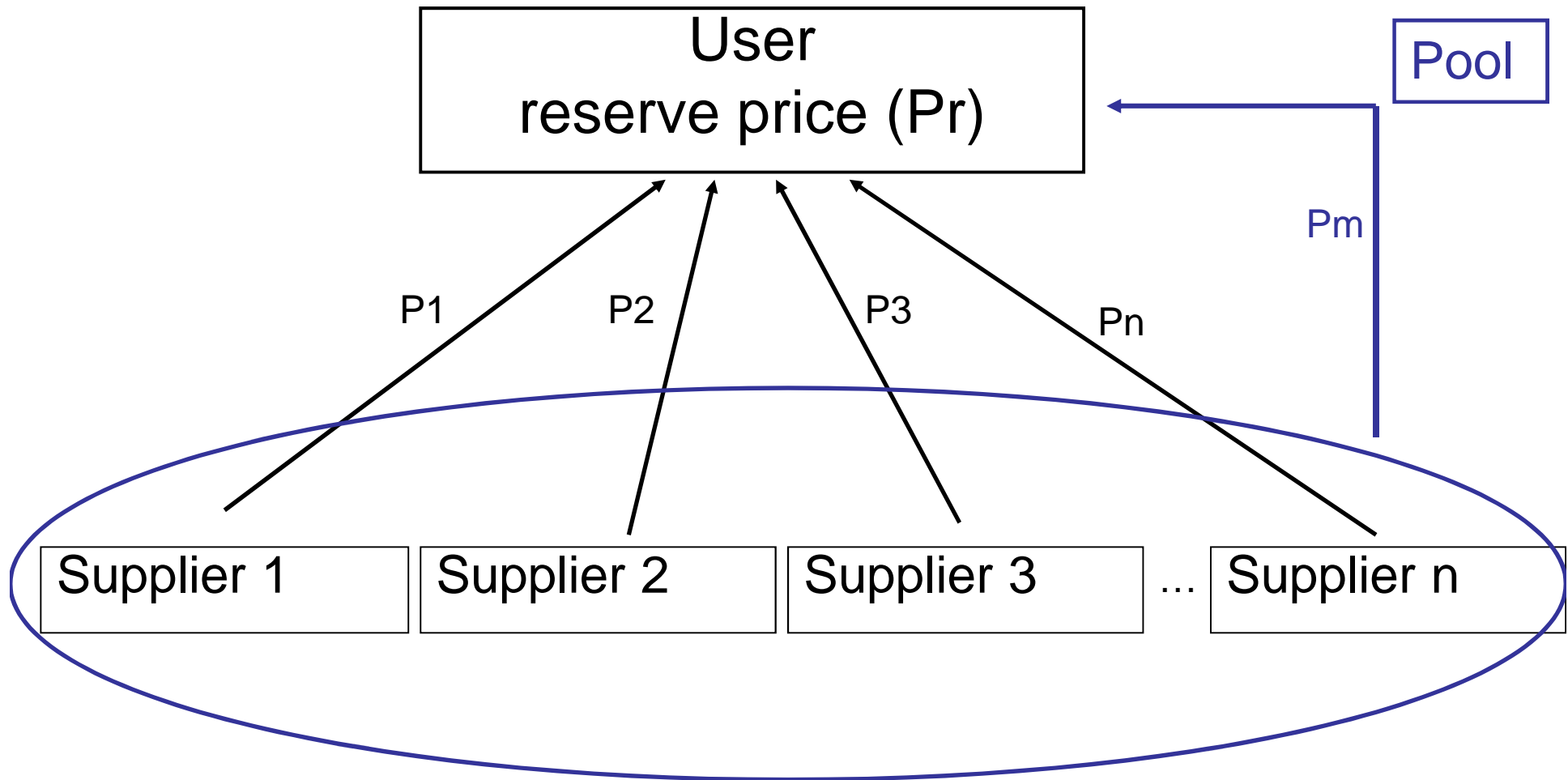
*In the case of **fragmented property rights over a resource** there is a risk of suboptimal use of this resource due to the addition of monopoly situations that increases the overall price to exploit the resource*

Penin, Julien - Strategic use of
patents

« Tragedy of the anticommons » (2)

- ❑ Heller et Eisenberg (1998)
 - ❑ Electronics
 - ❑ Biomedical sciences (research tools)
- ❑ Two main causes to the tragedy:
 - ❑ Transaction costs (if the ownership of the resource is fragmented, users must ask access to many owners)
 - ❑ Multiple marginalization (Cournot, 1838)

Tragedy of the anticommons: $P_1 + P_2 + P_3 + \dots + P_n > P_r > P_m$



Cournot: Multiple marginalisation: $P_1 + P_2 + P_3 + \dots + P_n > P_m$

from John H. Coase, "The Problem of the Social Cost", 1960

4) Reputation strategy (1)

Patents to certify and signal competences

- ☐ Patent as label of innovation
 - ☐ Patents signal competences (know-who)
 - ☐ Patent databases have a strategic dimension
- ☐ Incomplete information, adverse selection and signalling
 - ☐ Spence (1973) « job market signalling »
- ☐ Patenting may enable firms to :
 - ☐ Find partners (RJV, scientific collaborations)
 - ☐ Attract funds (Venture capital, buyout)
 - ☐ Attract researchers
 - ☐ Find customers and suppliers
 - ☐ Deter rivals
 - ☐ Patent to lure? (to misguide rivals)

4) Reputation strategy (2)

Patents to certify and signal competences

- ☐ Patents: A label of innovation?
 - ☐ Jaffe & Lerner (2004) « Innovation and its discontents »
 - ☐ Is the signal really separating?
- ☐ The issue of patent fees (autoselection)
 - ☐ Are patent applications really too expensive?
 - ☐ Selection *ex-ante* or *ex-post*?
- ☐ Patents and other signalling instruments
 - ☐ Scientific publications
 - ☐ Conferences
- ☐ The control of forward inventions

5) *Partnership strategy*

Patents to collaborate

- ☐ Patents play a central role in inter-firms collaborations
 - « facilitator of alliances »
- ☐ Patents may intervene at all the level of a collaboration:
 - ☐ Signal of competence
 - ☐ Protection *ex-ante* (increase incentives to participate)
 - ☐ Instrument of negotiation (increase bargaining power)
 - ☐ Measure competences of each actors
 - ☐ Structure the alliance, give a legal basis
 - ☐ Shared language
 - ☐ Co-patent: facilitate the sharing of the research results
- ☐ The life science example
 - ☐ Alsace Transfection

6) *Open strategy*

Patents to control the diffusion of technologies

- ❑ Sometimes inventors must ensure a wide diffusion of their technology
- ❑ Network industries (multi-sided market)
 - Try to set-up a standard
 - Increasing returns of adoption (ex. Qwerty)
 - Winner is not the best but the first
 - Business model based on complementary assets
 - Market share vs. Market size
- ❑ Firms may be induced to grant license widely at a low fee
- ❑ Secrecy and over-protection are often not an option to valorize a technology

6) *Open strategy*

Patents to free technologies

- ☐ Objective: to preserve the freedom of a technology (prevent appropriation by others)
- ☐ Patent or defensive publication?
 - ☐ The control of downstream innovations
- ☐ « Legal jujitsu » (Benkler, 2006)
- ☐ Patent in a copyleft style (grantback mechanism)
 - ☐ Viral license
 - ☐ The BIOS case

Conclusion

- ❑ Multiple use of the patent system
- ❑ The use is sector specific
 - ❑ Not one patent system, but one for each sector
- ❑ Patent to exclude versus patent to include
 - ❑ The coordination role of patents
- ❑ Implications for innovation policies
 - ❑ Costs
 - ❑ Languages